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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/041,678	01/07/2002	Gilbert Wolrich	10559-610001 / P12849	2963

20985 7590 05/10/2004
FISH & RICHARDSON, PC
12390 EL CAMINO REAL
SAN DIEGO, CA 92130-2081

EXAMINER

CHACE, CHRISTIAN

ART UNIT PAPER NUMBER

2187

DATE MAILED: 05/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/041,678

Applicant(s)

WOLRICH ET AL.

Examiner

Christian P. Chace

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>13</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 14 April 2004 has been entered.

Response to Amendment

Previously submitted amendment filed 26 February 2004 has been entered, and this Office action is in response to same. Applicants' arguments have been carefully and respectfully considered, but they are not persuasive. However, as this Office action is a first action on merits in response to a request for continued examination, it is NOT final.

Information Disclosure Statement

An Information Disclosure Statement was received 14 April 2004. However, none of the US Patent references, and US Patent Application references were received by examiner. The references that were received by examiner have been considered, and initialed on the PTO form 1449, which is attached hereto. The references that were not considered have a line drawn through them on the PTO form 1449, which is attached hereto. See MPEP 609 C. I. Examiner notes that resubmission of the missing documents as an electronic IDS may best enable most efficient prosecution.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Chang et al (US Patent # 5,634,015).

With respect to independent claims 1 and 16, a method and article comprising a computer readable medium that stores computer-executable instructions (method) is disclosed in the abstract as providing for data communications.

Storing queue descriptors in a memory, the queue descriptors each specifying a structure of a respective queue is disclosed in column 18, lines 12-16, which discloses a QCB in the GAM (discussed in ore detail below) which stores a head pointer and a queue tail pointer, which are queue structures.

Determining which of the queue descriptors stored in the memory were most recently accessed according to "a criterion" is disclosed in column 18, lines 6-11, which discusses a queue being a list of packets stored in sequence, with a packet at the queue head being for urgent traffic. Being for urgent traffic is the "criterion" used. As the packets are received in sequence, the most recently accessed is at the top of the queue, and would, therefore, be dequeued from the head, as discussed in the citation.

Storing the determined subset (the subset being interpreted by examiner to be the QCB head pointers which inherently refer to the top of the queue list, or the most

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recently accessed packets, as discussed supra) of queue descriptors on a cache in a processor's memory controller logic is disclosed in column 12, lines 29 and 30, which discuss the GAM local memory (cache) accessed by the processor P14.

Receiving a request to perform an enqueue or a dequeue operation with respect to a particular queue is disclosed in column 17, line 7 as an enqueue operation. A dequeue operation is disclosed in column 11, lines 40-43, which discloses releasing a packet to a free list of buffer space. This release inherently requires dequeuing, as there cannot be a queue for a buffer that does not exist any longer.

A queue descriptor (buffer pointer) is disclosed in column 17, lines 45-47. A cache is disclosed in figure 1 as local memory #30. Referencing a corresponding queue descriptor stored in the cache (in a processor's memory controller logic) to execute the operations, the queue descriptor specifying a structure of the particular queue is disclosed in column 17, lines 20-51 as the BTE, which is stored in the local memory and references corresponding descriptors.

With respect to claims 2, 10, and 17, maintaining a list of addresses associated with the subset of queue descriptors stored in the cache is disclosed, again, as the BTE stored in GAM local memory #30 in column 17, lines 20-51. The list being stored in a content addressable memory, or CAM, is disclosed in column 11, line 17, which discloses that the GAM local memory #30 is indeed a CAM. Also, column 48, lines 57-59 reinforce the desirability of an associative memory, which is what a CAM is.

With respect to claims 3 and 18, storing in the cache a queue descriptor corresponding to each address in the list I disclosed in column 17, line 25.

With respect to claims 4, 11, and 19, "tracking" an address stored in the local memory is disclosed in column 18, lines 5-12, the address corresponding to a queue descriptor that was least recently used for an enqueue or dequeue operation, as discussed supra with respect to claims 1 and 16.

With respect to claims 5, 12, and 20, removing the LRU address from the list if the list lacks an entry corresponding to the queue specified by the request and replacing the removed address with an address corresponding to the specified queue is disclosed in column 2, lines 22-28.

With respect to claims 6, 13, and 21, issuing commands to the memory controller logic to return and fetch queue descriptors to and from the memory is disclosed in column 17, lines 35-45. Maintaining coherence between the queue descriptors in the cache and the list of addresses in the local memory (CAM) is performed through the 1:1 ratio of descriptors each having their own address, as disclosed in the cited passage.

With respect to claims 7 and 14, modifying the queue descriptor referenced by the enqueue or dequeue operation and returning the modified queue descriptors to memory from the cache is disclosed in column 17, lines 45-51. When a buffer goes from free buffer to allocated, the BTE information is "modified," or changed.

With respect to claims 8 and 23, executing an enqueue operation without waiting for completion of a previous operation is discussed in column 5, lines 26-29. Also, column 16, line 38 discloses "multicast," which being multiple operations being performed at one time, reads on the instant claim as well. The passage recites,

"Without waiting for sources" of new allocation, a new allocation being an enqueue operation.

With respect to independent claim 9, a memory to store queue descriptors is disclosed as PM #16 in figure 1, to which the BTE references queues. The BTE specifies the structure of the respective queues stored in PM #16 as they are allocated from the free buffer pool.

A network processor is disclosed coupled to the memory as #22 in figure 1.

A memory controller logic that includes a cache (#30) to store a subset of the queue descriptors (BTE) in the memory is disclosed as GAM #18 in figure 1 as well. Determining which of the queue descriptors stored in the memory were most recently accessed according to "a criterion" is disclosed in column 18, lines 6-11, which discusses a queue being a list of packets stored in sequence, with a packet at the queue head being for urgent traffic. Being for urgent traffic is the "criterion" used. As the packets are received in sequence, the most recently accessed is at the top of the queue, and would, therefore, be dequeued from the head, as discussed in the citation. Storing the determined subset (the subset being interpreted by examiner to be the QCB head pointers which inherently refer to the top of the queue list, or the most recently accessed packets, as discussed supra)

A programming engine that accesses a list of addresses in the memory corresponding to the queue descriptors stored in the cache is disclosed as BTE, as discussed supra with respect to claims 1 and 16.

The processor being configured to reference a corresponding queue descriptor in the cache in response to a request to perform an enqueue or dequeue operation with respect to a particular queue, also discussed with respect to claims 1 and 16, is disclosed in column 17, lines 45-47.

With respect to claim 15, the processor being configured to execute an enqueue operation without waiting for completion of a previous operation is disclosed supra with respect to claim 8. Doing so if the queue would otherwise be "unempty" upon completion of the dequeue operation is disclosed in column 20, lines 23-27.

Response to Arguments

With respect to applicants' argument that Chang does not describe or suggest, "determining which of the queue descriptors stored in the memory were most recently accessed according to specific criteria, and storing the determined subset of queue descriptors in a cache in a processor's memory controller logic," examiner respectfully notes that this is not the exact claim language, and, therefore, the instant argument is not commensurate in scope with the actual claim language in claim 1, as asserted by applicants in the 3rd paragraph of their remarks section of the instant amendment. However, the actual claim language is addressed supra with respect to Chang's anticipation of same.

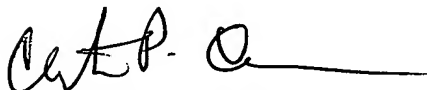
With respect to applicants' similar arguments for claims 9 and 16, examiner has addressed the alleged deficiencies of Chang et al as it relates to the instant claim language supra.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christian P. Chace whose telephone number is 703.306.5903. The examiner can normally be reached on 9-4-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald Sparks can be reached on 703.308.1756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Christian P. Chace